Journal of Natural Resources & Environmental Law

Volume 8
Issue 2 *Journal of Natural Resources & Environmental Law, Volume 8, Issue 2*

Article 10

January 1993

The Norms of Nuclear Accidents after Chernobyl

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INTRODUCTION

On April 26, 1986, a chemical explosion occurred at the Chernobyl nuclear power plant in the former Soviet Union, resulting in nuclear contamination on a global scale. It came as a considerable shock to the world that an accident in a nuclear power plant could have significant effects thousands of miles away. Although other nuclear power accidents had occurred prior to Chernobyl, the damage had largely been confined to limited areas. At Windscale, for example, a fire in the plutonium reactor spewed radioactive iodine into the air near the Irish Sea for three days.[1] All of the resulting damage was confined to the general area surrounding the reactor.[2] At Three Mile Island, a partial nuclear meltdown occurred.[3] Once again, however, the scale of the accident was minimal and the damage was limited to the immediate area. The Chernobyl incident is unique because it was the first nuclear accident in which radioactivity damage crossed transnational boundaries.[4]

In relation to Chernobyl, the former Soviet Union did not provide immediate information to other states that could potentially be affected by the nuclear incident, and it has not paid compensation for any of the damage which other states claim to have suffered as a result of the accident. The former Soviet Union's failure to notify other states immediately and its refusal to compensate for damages were not in violation of any inter-

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[1] *See Stark Fallout from Chernobyl*, U.S. NEWS & WORLD REP., May 12, 1986, at 20. Approximately 39 cancer cases were eventually traced to the Windscale accident, *id.*

[2] *See id.*

[3] *See id.*

[4] *See id.*

national agreement to which it was a party.[5] This inaction was problematic for the international community, given the severity of the transboundary radiological consequences. Chernobyl illustrates both the danger of "global disasters" which will inevitably arise as a consequence of large-scale industrial activity and the normative expectations regarding the mitigation and reparation of accidental transboundary nuclear harm.

The international reaction to the Soviet management of the Chernobyl crisis provides a clarification of normative expectations regarding acceptable responses to nuclear accidents with transnational consequences. As shown in this essay, the incident reveals two established norms: (1) a state has a duty to warn other states in a timely fashion of any nuclear accident that may endanger their territory or residents; and (2) a state has a duty to compensate for injury to other states caused by nuclear mishap.

I. BACKGROUND AND FACTS

The accident at Chernobyl's number four reactor occurred during an experiment designed to determine how long the reactor would continue to produce electricity in the event of an unexpected power cutoff.[6] According to Soviet officials, a series of explosions occurred, probably touched off by a malfunctioning turbine and electrical failure.[7] The resulting fire spread to equipment and then to the reactor itself.[8] The explosion blew the top off the reactor and then spread a cloud of radioactive

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[5] At the time of the Chernobyl accident there existed no multilateral treaty requiring the provision of prompt and detailed information, either for general air-carried pollution or specifically for radioactive materials. *See* PETER H. SAND, CHERNOBYL: LAW AND COMMUNICATION xviii-xix (1988). No applicable treaty to which the former Soviet Union was a party expressly provided for liability for transboundary environmental damage. The Vienna Convention on Civil Liability for Nuclear Damage, *opened for signature* May 21, 1963, IAEA Doc. CN-12/46, creates absolute liability for operators of nuclear plants that cause transboundary harm, but the former Soviet Union was not a party that convention. The former Soviet Union was a party to the Convention on Long-Range Transboundary Air Pollution, Nov. 13, 1979, T.I.A.S. 10, 541, 18 I.L.M. 1442. All Eastern European states, as well as members of the Common Market, had signed the convention, but that agreement did not obligate states to compensate for injuries resulting from transboundary air pollution.

[6] *Anatomy of a Catastrophe*, NEWSWEEK, Sept. 1, 1986, at 26.

[7] *See What Happened at Reactor Four*, 43 BULL. ATOM. SCI. 26-31 (1986).

[8] *See Chernobyl's Fiery Story Emerges*, U.S. NEWS & WORLD REP., May 19, 1986, at 23.

residue across the former Soviet Union, as well as across much of Europe.[9] The radiation from Chernobyl, which initially swept over Norway, Finland, and Sweden on April 28, was brought into the heart of Europe by shifting winds on May 5, 1986.[10]

On April 28, 1986, workers set off radiation alarms as they entered Sweden's Forsmark nuclear power plant.[11] Later that day Swedish Energy Minister Briggita Dahl still had no information as to the source of the fallout, although experts concluded that an accident had probably occurred in the former Soviet Union twenty-four hours earlier.[12] Some seventy-two hours after the accident had occurred, the Soviet Representative to the International Atomic Energy Agency (IAEA) finally informed the Director General of the IAEA, Hans Blix, that an accident had occurred at 1:23 a.m. on April 26.[13] It was not until May 10, 1986, that officials of the former Soviet Union notified the world that a major accident had taken place at its Chernobyl plant.[14] The Soviet Union also did not publish details for dissemination in its own country regarding Chernobyl until that time.[15]

The full effect of the accident on people, property, and the environment are still difficult to assess. In the former Soviet Union, thirty-one people died as a direct result of the incident within a few weeks, and three more died during 1987.[16] Over two hundred people were seriously injured.[17] One hundred and

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[9] *See id.* Among the nations directly affected by the radioactive waste released by the Chernobyl accident were the Netherlands, Finland, Italy, Norway, Sweden, Switzerland, Poland, and Hungary. It is estimated that the amount of radiation detected in Sweden was fifteen times the normal amount, four times greater in Switzerland, and twice as great in Italy. Nations affected economically by contaminated food included Canada, West Germany, and many other countries who imported food from the former Soviet Union. *See* Ruby Abramson, *Soviets Put Out Fire on Sub, Tow It Northeast; Weinberger Says Blast on Nuclear-Armed Craft Killed More Than 3; No Radiation Indicated,* L.A. TIMES, Oct. 6, 1986, at 12.

[10] *See* Gerald M. Boyd, *Reagan Home from the Tokyo Meeting, Is Jubilant,* N.Y. TIMES, May 8, 1986, at A6.

[11] *See Swedish Plant Detected Soviet Fallout; Stockholm Angry at Lack of Warning,* WASH. POST, Apr. 29, 1986, at A14.

[12] *See id.*

[13] *See* SAND, *supra* note 5, at 2.

[14] *See Soviet Nuclear Reactor Accident at Chernobyl,* 86 DEPT. ST. BULL. No. 2112, 71, 73 (1986).

[15] *See* Philip Taubman, *Soviet Warns of Risks to Health,* N.Y. TIMES, May 11, 1986, at A1.

[16] *See* SAND, *supra* note 5, at 2.

[17] *See Chernobyl's Goal,* NEWSWEEK, July 28, 1986, at 33.

thirty-five thousand people, some living as far as one hundred miles from the Chernobyl plant, were evacuated from the area.[18] Scientists are now concerned with the long-term effects of the accident, which may include tens of thousands of cancer deaths.[19] In the former Soviet Union, an area approximately the size of Rhode Island is believed to have been contaminated.[20] Outside of that country, European farmers sustained millions of dollars of damage from crops, livestock, and dairy and egg products which could not be sold as a result of potential or actual contamination.[21] The total loss is estimated to run into hundreds of millions of dollars.[22]

II. CONFLICTING CONCEPTIONS OF LAWFULNESS

The Chernobyl incident suggests that elites in the former Soviet Union and in Western Europe differed in their expectations as to how states involved in nuclear accidents should behave. These divergent expectations related to the interpretation and authority of two normative expectations: (1) the duty to inform other states of an actual or potential transborder release of radioactive material; and (2) the duty to compensate for damage caused to other states by a nuclear accident.

A. The Duty to Inform

1. Comparison of KAL 007 and Chernobyl

On September 1, 1983, Korean Air Lines (KAL) flight number KE 007 was shot down by a Soviet fighter when it penetrated restricted Soviet airspace over a military base located on

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[18] *See Chernobyl: The Soviet Report*, NUCLEAR NEWS SPECIAL REPORT, Sept. 11, 1986, at 1.

[19] The estimates of expected cancer deaths range from five to forty thousand for the former Soviet Union and from two to six thousand for elsewhere in Europe.

[20] *See Stark Fallout from Chernobyl*, *supra* note 1, at 18. Chernobyl is located about 80 miles from Kiev in the heart of the Soviet wheat land. Approximately 47% of the former Soviet Union's winter wheat was grown there, *id.* at 19.

[21] *See* Jackson Diehl, *Chernobyl's Other Losses; In Eastern Europe Farmers Bear Brunt*, WASH. POST, June 8, 1986, at A1.

[22] *See* Robert Gillett, *2 Pacts Approved to Handle Nuclear Accidents; One Calls for Prompt Disaster Disclosure, the Other for Swift Emergency Aid*, L.A. TIMES, Sept. 27, 1986, at 4 [hereinafter *Pacts*].

Sakhalin Island.[23] Both the shooting down of KAL 007 and the Chernobyl nuclear disaster engaged the post-Brezhnev Soviet leadership in unforeseen crises with serious international repercussions. Although there were significant differences between the two episodes—above all, the fact that the downing of KAL 007 had no direct consequences for the Soviet population—a comparison of the way in which the two events were handled offers a revealing look at persistent characteristics of Soviet organizational behavior, as well as evidence of departures from earlier practices.[24]

In both the KAL 007 shooting and the Chernobyl accident, the Soviet leadership took immediate measures to deal with the crisis at hand, while at the same time launching an internal investigation to provide itself with a complete and accurate account of the episode.[25] However,the leadership's initial public reaction to both events was an official silence and even a denial. The first Soviet mention of the KAL 007 airliner was a Tass dispatch that simply reported its disappearance,[26] while in the case of the Chernobyl disaster, the official reticence continued for almost a full week.

During the first twenty-four hours after the disappearance of KAL 007, Soviet diplomats in Washington and Moscow professed to have no knowledge of the plane's fate, while the Soviet ambassador to Japan called reports that the plane might have been shot down by Soviet aircraft an "unfriendly comment."[27] Even after the U.S. Secretary of State formally announced that the plane had been shot down by Soviet aircraft, Soviet statements continued to imply innocence and deny any responsibility for the fate of the missing aircraft, while at the

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[23] *See TASS Statement on Incident*, N.Y. TIMES, Sept. 2, 1983, at A4; *see generally* ALEXANDER DALLIN, BLACK BOX: KAL 007 AND THE SUPERPOWERS (1986) (accounting the downing of KAL 007 and the Soviet handling of it).

[24] It should be noted that in neither of the two episodes did the Soviet government accept any financial responsibility, or offer any compensation for the losses incurred as a result of its actions. We will, however, examine the KAL shooting only with respect to the notification norm. This is because the damage claims in the two incidents differ greatly in extent and nature, while the comparison of the initial Soviet management can indicate consistency, as well as change, in the Soviet regard for information.

[25] For a useful account of the initial sequences of responses to the Chernobyl accident, see DAVID R. MARPLES, CHERNOBYL AND NUCLEAR POWER IN THE USSR 1-35 (1986).

[26] *See* DALLIN, *supra* note 23, at 2.

[27] *See id.* at 3.

same time arguing that its intrusion into Soviet airspace had been a premeditated act in furtherance of an intelligence mission. It was not until a full week after the episode—when U.S. Ambassador to the United Nations, Jeane Kirkpatrick, played tapes of the Soviet intercepts to the United Nations Security Council—that Soviet United Nations delegate Oleg Troyanovsky finally acknowledged the fact that the jet had indeed been downed by Soviet aircraft.[28]

The initial Soviet response to the Chernobyl disaster reflected a strikingly similar pattern. The first reference to the disaster was a Tass statement carried on Radio Moscow forty-eight hours after the event, and four full days elapsed from the time of the initial explosions at the reactor before it was reported in the Soviet press on April 30 that "an accident ha[d] occurred at the Chernobyl Atomic Power Station" and that "measures [were] being taken to eliminate the consequences of the accident."[29] Indeed, even as massive evacuations of residents were taking place, some Soviet officials were alleging that the reported radiation came from Western nuclear tests, and one diplomat defended the failure of Soviet authorities to inform neighboring states promptly by suggesting that "the governments of proper countries are usually on holidays during weekends."[30] Yet another six days elapsed before a full press conference was devoted to the event.[31]

2. Claims by Affected States

The affected states, consisting of the European countries, argued that the former Soviet Union was obligated to provide them with immediate information regarding the Chernobyl accident.[32] The failure of that country to notify these states

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[28] *See id.* at 13.

[29] IZVESTIYA, Apr. 30, 1986 *reprinted in* CURRENT DIG. SOV. PRESS, May 21, 1986, at 1. Even these terse initial statements were not carried in full by the Ukrainian press. The references to the victims as well as to the creation of an investigating commission were deleted, *id.*

[30] *E. Pozdynayakov on ABC Nightline*, NEWSWEEK, May 12, 1986, at 19.

[31] *See* MARPLES, *supra* note 25, at 18.

[32] Following the Chernobyl accident many states maintained that the obligation to provide emergency information was a rule of international law. Much of the criticism of the Soviet failure to provide information immediately after the accident was couched in legal terms. *See, e.g.*, Statement of the U.S. Secretary of State: "When an incident has cross border implications, there is an obligation under international law to inform

promptly prevented European governments from being prepared to deal with the harmful effects of the radioactive fallout. Delay in notification resulted in the contamination of foods, radiation sickness, and worldwide hysteria.[33]

However, what the outside world perceived as extraordinary ineptness, if not outright duplicity, in the Soviet handling of the Chernobyl accident, in fact, reflected, when considered together with the KAL 007 episode, a characteristic Soviet set of priorities. Evidently, the first concern of the Soviet leadership was with managing the domestic rather than the international reaction and with maintaining its credibility and image of infallibility with its own population in the face of these threatening critical events.

Yet, there seems to have been essential agreement between all parties regarding the importance of early notification in the event of nuclear accidents with possible transboundary consequences. This concurrence is evident from the former Soviet Union's actions once it realized the political damage caused by the seventy-two hour vacuum of information. In a joint communique following the visit by an IAEA delegation to the former Soviet Union in early May 1986, that country stated its willingness to provide information on the accident as it became available and undertook to provide the IAEA with daily information on radiation levels at a number of meteorological stations located close to the Chernobyl plant.[34] Furthermore, in a message to the Secretary General of the United Nations on June 3, 1986, Gorbachev referred to the need for "a system of prompt notification in the event of accidents and malfunctions at atomic power plants when such occurrences are accomplished by the release of radiation."[35] Thus, the Soviet leadership implicitly acknowledged its inadequate handling of the interna-

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others and do it promptly." *Deadly Meltdown*, TIME, May 12, 1986, at 43. *See also* Statement of the Group of Seven at the Tokyo Summit, *reprinted in* 25 I.L.M. 1005. "Each country . . . is responsible for prompt provision of detailed and complete information on nuclear emergencies and accidents, in particular those with potential transboundary consequences. Each of our countries accepts that responsibility . . . ." *See infra* notes 55-59 and accompanying text on the Tokyo Summit.

[33] *See* Stuart Diamond, *Chernobyl Causing Big Revisions in Global Nuclear Power Policies*, N.Y. TIMES, Oct. 27, 1986, at A1.

[34] *See The Soviet Union and the Development of Nuclear Powers*, 28 IAEA BULL. 8 (1986).

[35] Elaine Sciotino, *Gorbachev Favors Atom Safety Code*, N.Y. TIMES, June 4, 1986, at A12.

tional aspects of the episode. Similarly, when a Soviet submarine carrying nuclear weapons sank off the coast of Bermuda, the former Soviet Union immediately notified the United States, on October 4, 1986, in accordance with the norm of quick response when its credibility was at stake.[36] The former Soviet Union also was the first state to ratify the Convention on Early Notification of a Nuclear Accident in response to the Chernobyl situation.[37]

Hence, unlike the KAL 007 shooting, the initial silence involved in the Chernobyl incident was followed by a steady and fairly detailed flow of information from the former Soviet Union, as well as an expressed willingness to improve the system of international notification. This difference suggests that while there may have been an international conflict regarding priorities—that is, the former Soviet Union was primarily concerned with managing its domestic image rather than the international reaction and consequences, while the victim states considered the international concern to take first priority—in the Chernobyl accident, there was agreement on the norms of early warning in the event of nuclear accidents with potential transboundary effects.

B. The Duty to Compensate

The former Soviet Union refused to pay any compensation for the Chernobyl incident.[38] The country's *a priori* rejection of possible claims for compensation implied that it viewed such claims as inappropriate in light of the extent and nature of the calamity suffered by the source state.[39] Thus, the Soviets sought

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[36] *See Moscow's New Policy Reflected in Sub Report*, N.Y. TIMES, Oct. 5, 1986, at A14; *Death on a Soviet Sub*, NEWSWEEK, Oct. 13, 1986, at 51 "The [United States] State Department commended the Kremlin for its 'quick notification' of the incident and offered U.S. assistance, which the Soviets so far have not accepted." *Id.*

[37] *See* SAND, *supra* note 5, at 49.

[38] *See* Robert Gillette, *Soviets Ready to Discuss Liability Pact for Nuclear Mishaps; Moscow Won't Compensate West for Chernobyl But Will Consider Question for Future*, L.A. TIMES, Oct. 6, 1986, at 12 [hereinafter *Liability Pact for Nuclear Mishaps*].

[39] Expressions of Soviet anger appear to have reflected, at least in part, the view that informal Western demands for compensation constituted an illegitimate political and economic exploitation of the disaster in the former Soviet Union. *See, e.g., European Ban on Flood Imports Viewed as Cynical Scheme to Boost Own Economies*, PRAVDA, May 18, 1986, at 4, *reprinted in* CURRENT DIG. SOV. PRESS, July 9, 1986, at 16 (claiming that Western precautions regarding Soviet food imports reveal a plan to "damage" the Soviet economy, and rejecting informal compensation demands on that basis).

to reject the principle that a source state is fully accountable for transboundary harm and chose instead to pursue an ideal of international solidarity: exercising cost sharing between source state and victim state in the context of catastrophic nuclear accidents.[40]

In contrast, affected states did not accept the principle of international solidarity in the case of nuclear accidents with transnational consequences. In the wake of the former Soviet Union's refusal to consider compensation payments, several countries felt compelled to reemphasize the basic applicability of the "polluter pays" principle to accidental transboundary nuclear harm.[41] These states, thus, rejected the former Soviet Union's implied "victim pays" philosophy which entailed the notion that victim states should bear, or at least share the costs, as a conceptual framework for allocating nuclear damages between source and victim states.

Furthermore, the former Soviet Union claimed that Western nations instigated most of the problems by instituting "unnecessary" radioactive monitoring and food restrictions.[42] That is, damages abroad resulted from actions taken by authorities overanxious to protect their populations against overestimated long-term risks of radiation exposure. These damages, Soviet sources maintained, could not qualify as internationally compensable costs of the reactor accident.[43] Some European states, however, in threatening the former Soviet Union with claims for reparation, implied that even if it were determined that the fallout from Chernobyl caused no measurable damage in the environment, the cleanup costs associated with the efforts of states to mitigate possible anticipated damage could be treated as a form of indirect or consequential damages which should

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[40] For an exposition of the principle that a source state is fully accountable for transboundary nuclear pollution, see Gunther Handl, *National Uses of Transboundary Air Resources: The International Entitlement Issue Reconsidered*, 26 NAT. RESOURCES J. 405 (1986).

[41] For example, Walter Wallmann, West German Minister for the Environment and Nuclear Safety, stated that "the principle that the 'polluter pays' must be applied when compensation for damages is sought. Financial responsibility for trans-border damages must be borne by the country that causes an accident." *Toward Nuclear Safety*, N.Y. TIMES, Nov. 7, 1986, at A35.

[42] *See Pacts, supra* note 22.

[43] *See id.*

be compensated.[44] This norm, that costs incurred for preventative or mitigative measures taken by a state that is the victim of significant transboundary pollution should be reimbursed, appears to have been vindicated in the Cosmos 954 satellite crash.

1. Comparison of Cosmos 954 and Chernobyl

In the winter of 1978, Cosmos 954, a nuclear powered Soviet satellite, plunged through the earth's atmosphere, crashed in Canada, and strewed radioactive material across the tundra.[45] After months of environmental cleanup efforts, the Canadian government presented the former Soviet Union with a bill of $6 million.[46] After initially refusing to pay, the former Soviet Union later entered into negotiations with Canada, and eventually agreed to pay three million Canadian dollars as damages for the injury caused by the Cosmos 954 accident.[47] This payment was made even though the Canadian government had conducted its extensive cleanup effort with the distinct possibility that no actual measurable damage had occurred.

Thus, the Canadian-Soviet agreement settling Canada's claim for damages in the Cosmos 954 incident seems to support a norm of compensating for the efforts of states to prevent or mitigate anticipated damage. However, even though the Soviets partly reimbursed the Canadians for their cleanup costs after the satellite crash, this approach was not adopted in the Chernobyl situation. Therefore, the former Soviet Union, in its refusal to compensate for Chernobyl damages, implied that there is a distinction between transboundary pollution resulting from nuclear accidents and that resulting from accidents such as satellite crashes.

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[44] Swedish officials studied the possibility of suing Moscow for damages to their farmers but said it was unlikely they could do so. *See* REUTERS NORTH EUROPEAN SERV., May 23, 1986, (AM cycle). The West German government demanded that the Soviet Union pay damages to West German farmers, *id.* Farmers in Northern England asked for compensation for lambs that could not be slaughtered and sold. *See* REUTERS NORTH EUROPEAN SERV., June 30, 1986, (AM cycle). Damages resulting from preventive measures taken thus were central to threats of litigation.

[45] *See* Eilene Galloway, *Nuclear Pwered Satellites: The U.S.S.R. Cosmos 954 and the Canadian Claim*, 12 AKRON L. REV. 401, 401 (1979).

[46] *See id.* at 413.

[47] *See Liability Pact for Nuclear Mishaps*, *supra* note 38. The Soviets paid $3 million to Canada "in full and final settlement of all matters connected with the disintegration of the Soviet satellite 'Cosmos 954' in January 1978." *Id.*

There are a number of possible reasons for the former Soviet Union's refusal to follow the practice used in the Cosmos 954 crash. One such reason has to do with the much greater damage inflicted upon the world by a nuclear accident of this proportion. The total damage caused by Cosmos 954 was approximately $16 million.[48] This amount pales in comparison to the hundreds of millions of dollars of estimated damages which have occurred as a result of the Chernobyl incident.[49] Additionally, the entire scope of the Chernobyl damage may not become apparent for several years.[50] Many health problems caused by the radiation exposure, for example, do not manifest for years. Accordingly, claims from a variety of parties, both nations and individuals, will undoubtedly arise periodically over the next ten to twenty years. To further complicate the compensation process, the connection between health problems and radiation exposure from Chernobyl will be attenuated and difficult to ascertain.

Another distinction between the Cosmos 954 incident and that at Chernobyl is the Cosmos 954 incident involved physical debris as well as radiation contamination. The damage was confined to an easily identifiable area and enabled a fairly accurate accounting of actual cleanup expenses. In contrast, the Chernobyl damage was primarily radiation-oriented, and damage caused by such radiation was spread over a large area as a result of nuclear fallout. This could give rise to serious questions on the part of the former Soviet Union as to what

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[48] *See* Galloway, *supra* note 45, at 413.

[49] *See Pacts, supra* note 22. Chernobyl might be compared with the Bhopal disaster. On December 3, 1984, a large quantity of methyl isocynate gas escaped from a pesticide plant in Bhopal, Madhya Pradesh, India, killing more than 2000 people and injuring perhaps as many as 200,000 others. In the Bhopal aftermath, there was a flurry of suits brought on behalf of many victims, and Union Carbide expressed an interest in negotiating, making a $200 million settlement offer (which was turned down by the Government of India on April 5, 1985). *See generally*, Rajeev Dhavan, Note, *For Whom? And for What? Reflections on the Legal Aftermath of Bhopal*, 20 TEX. INT'L L.J. 285 (1985). The settlement offer and the litigation suggest, first of all, a difference in the way multinational enterprises, like Union Carbide, and states, like the former Soviet Union, deal with enormous damage claims, and second, a difference in response to damage claims based primarily on personal death or injury, as opposed to preventive or environmental damages. This might explain why the Soviet government did not pay in the Chernobyl incident, despite the fact that it was not the first industrial accident to involve large damage claims.

[50] For an in-depth discussion of the effects of radiation poisoning in humans, see Herbert L. Abrams, *How Radiation Victims Suffer*, 43 BULL. ATOM. SCI. 13 (1986).

claims for damages are actually legitimate. This problem was evidenced by that country's insistence that claims for compensation based on preventive and mitigative measures were not supportable.

From the comparison of the former Soviet Union's actions in the Cosmos 954 satellite crash with its actions in the Chernobyl nuclear disaster, that country's implicit beliefs against the responsibility of compensating for damage resulting from Chernobyl are evident. In the context of catastrophic nuclear accidents, where damage costs can be enormous and damage claims can be more difficult to support, the norm of full accountability is weakened. In contrast, the victim states claimed that, while the damages involved in a nuclear accident like Chernobyl are far greater than those caused by a falling space orbit, this difference does not suggest the inapplicability of the norm requiring compensation from the source state. Nor does the uncertainty of the damages prevent recovery on the basis of preventive and mitigative efforts taken by states in anticipation of radiation damages.

III. INTERNATIONAL APPRAISAL

The international reaction to the Soviet failure to provide information immediately after the accident was swift and pronounced. On May 1, 1986, the IAEA sent a telex to Soviet authorities, urgently requesting further details of the accident.[51] The twelve member countries of the Common Market protested the lack of notice and information.[52] The West German Foreign Minister, Hans-Dietrich Genscher, said the former Soviet Union should authorize visitation by the IAEA experts.[53] Although agency inspectors had visited Soviet nuclear power sites in the past, the agency did not have the authority to order the Soviet government to supply information about the accident.[54]

The first important international reaction to the delayed notification came on May 5, 1986, at the Tokyo Summit[55],

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[51] *See* E. J. Dionne, Jr., *Europe Demands All Soviet Details*, N.Y. TIMES, May 1, 1986, at A1.

[52] *See id.* Bernard Gwertzman, *Reactor Still Afire, U.S. Says; Soviet Reports Danger Down; Europeans Denounce Secrecy*, N.Y. TIMES, May 1, 1986, at A12.

[53] *See* Dionne, *supra* note 51.

[54] *See id.*

[55] *See* W. Allen Wallis, *The Tokyo Economic Summit*, 86 DEP'T ST. BULL. No. 2112, 64 (1986).

where seven major industrial nations and the representatives of the European Community issued a statement through the IAEA[56] calling for the former Soviet Union to acknowledge responsibility for the accident and to cooperate immediately by providing the requested information.[57] The Tokyo Summit nations[58] also expressed the need for an international agreement which would require the reporting of nuclear emergencies with transboundary consequences and the exchange of information during such events,[59] thus, implying intense dissatisfaction with the Soviet handling of the crisis.

Prompt action was taken. On May 21, 1986, the Board of Governors of the IAEA requested the Director General to convene a group to draft two international agreements, one of which would provide for early notification of nuclear accidents.[60] On July 21, 1986, a meeting began and by August 15, 1986, the group had reached a consensus on the text of the Convention on Early Notification of a Nuclear Accident,[61] which was adopted on September 26, 1986.[62] During the thirty days before ratification, the Convention received an overwhelming response, including fifty-eight signatories as of October 7, 1986.[63] The purpose of the Convention was to minimize transboundary radiological consequences through notification of an accident to any neighboring state or to the IAEA.[64] It applies to any

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[56] The IAEA, which was established on July 29, 1957, is an independent intergovernmental organization in the United Nations system. Its statutory objectives are: "[T]o accelerate and enlarge the contribution of atomic energy to peace, health, and prosperity throughout the world . . . [and to] ensure, so far as it is able, that assistance provided by it, or at its request or under its supervision or control, is not used in such a way as to further any military purpose." Multilateral Statute of International Atomic Energy Agency, *opened for signature* Oct. 26, 1956 - Jan. 24, 1957, 8 U.S.T. 1093, 1095 (entered into force July 29, 1957). For a discussion of the activities of the IAEA generally and in the wake of the Chernobyl accident, see generally Peter Riley, *The Legal Control of Nuclear Energy Between States*, 21 CAL. W. INT'L L.J. 303 (1990-91).

[57] *See Tokyo Summit Declaration on the Implications of the Chernobyl Nuclear Accidents*, INFCIRC/333, May 5, 1986, *reprinted in International Organizations and Agreements*, 37 NUCLEAR L. BULL. 36, 38 (1986).

[58] The Tokyo Summit nations included Canada, France, Great Britain, Italy, Japan, United States, and the Federal Republic of German. *See* Wallis, *supra* note 55.

[59] *See* Tokyo Summit Declaration on the Implications of the Chernobyl Nuclear Accident, supra note 57, at ¶ 4.

[60] *See* SAND, *supra* note 5, at 235.

[61] *See id.*

[62] *See id.*

[63] *See id.*

[64] For a full explanation of the content and purpose of the convention, see

state party, persons or legal entities under a state's control or jurisdiction, for any activity or facility "from which a release of radioactive material occurs or is likely to occur and has resulted or may result in an international transboundary release that could be of radiological safety significance for another State."[65]

Regarding the issue of compensation, the international community's response to the environmental and economic damage caused by the Chernobyl accident supports a norm of reparation in the event of nuclear accidents with transboundary consequences. Most elites emphasized the "polluter pays" principle.[66] At least one Western observer, however, called for a limit on Soviet liability "as a matter of practical politics and common sense."[67] He urged victim countries to absorb part of their damage costs as an expression of international solidarity in a world that utilizes nuclear power.[68] Nevertheless, very few elites supported the Soviet conception that full accountability did not apply in the case of catastrophic nuclear accidents.

Perhaps with the realization of the political damage that resulted from its refusal to make compensation payments, the former Soviet Union suggested after the Chernobyl accident that, although it had no legal obligation to compensate, a multilateral agreement "could envisage the liability of states for international damage."[69] However, any such agreement would also have to assign liability for the "material, moral, and political damage caused by unwarranted action taken under the pretext of protection against the consequences of nuclear accidents."[70] As of now, there has been no significant development in this direction, but the former Soviet Union's statement, while still stressing concern with illegitimate damage

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ADRONICO O. ADEDE, THE IAEA NOTIFICATION AND ASSISTANCE CONVENTIONS IN CASE OF A NUCLEAR ACCIDENT (1987).

[65] Convention on Early Notification of a Nuclear Accident, Art. 1.1, *opened for signature* Sept. 26, 1986, 25 I.L.M. 1370 (1986) (entered into force Oct. 27, 1986).

[66] *See, e.g., Record of the Fourth Plenary Meeting*, IAEA Doc. GC(SPL.I)/OR.1, at 10, ¶37 (statement of the Swiss delegate); *Record of the First Plenary Meeting*, IAEA Doc. GC(SPL.I)/ OR.1, at 27-28, ¶64 (statement of the West German delegate); *see also Toward Nuclear Safety, supra* note 41.

[67] Rubin, *The Soviet Nuclear Disaster and the Law*, 35 INT'L PRAC. NOTEBOOK 8, 9 (1986).

[68] *See id.*

[69] *See Liability Pact for Nuclear Mishaps, supra* note 38.

[70] *Id.*

claims, implies that perhaps that country was more in agreement with the compensation norm than was apparent.

IV. INTERNATIONAL IMPLICATIONS

The Chernobyl accident starkly illustrated the fact that nuclear pollution does not respect the boundaries between sovereign states. Until Chernobyl, the operation of national nuclear power reactors was generally considered a matter of domestic concern, with neighboring states having a limited legal interest. The accident undermined the viability of this view by demonstrating that the risks of nuclear power operations are intrinsically international in nature. This realization of the global scale of states' environmental interdependence led to the Notification Convention and the Soviet proposal for the development of the norms on liability. Nevertheless, questions remain as to how fully the international community has absorbed the lesson of interdependence in the nuclear world. Unfortunately, it seems that states are inclined to attach importance to transboundary environmental problems only when they themselves suffer serious direct damaging impacts.

A. Information Dissemination

In examining the Soviets' attempt to control the flow of information, the role of communication technologies cannot be ignored.[71] Even before the Chernobyl crisis, technological advancement as well as human communication had begun to undermine the insulation of the Soviet system and breach its secrecy. It was the Swedish government, among others, that recorded a sudden sharp rise in radiation levels and pressed the Soviet authorities for an explanation.[72] Indeed, Western technology played an essential role in providing information about Chernobyl to the outside world; military as well as private communications satellites passing high over Soviet territories supplied detailed photographs of the damaged reactor.[73] It may well be that the era in which a state can shut itself off from

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[71] For a discussion of the role of communication technology in Chernobyl, see SAND, *supra* note 5, at xvii-xviii.

[72] *See Swedish Plant Detected Soviet Fallout; Stockholm Angry at Lack of Warning*, WASH. POST, April 29, 1986, at A14.

[73] *See* SAND, *supra* note 5, at xvii.

the rest of the world and fail to provide information on a matter of global public concern is now past.

Regarding the Notification Convention, it can be said that the broad consensus which supported the early warning stipulations and the speed with which they were negotiated reflect the fact that states are willing and able to act decisively when their common interests are involved. However, the Convention cannot be accepted unreservedly as an instrument for clarifying norms. A close look at that document reveals some difficulties. Article 5, Section 3 of the Convention is seriously flawed in that it allows a notifying state to restrict the use of confidential information: "Information received pursuant to sub-paragraph (b) of Article 2 may be used without restriction, except when such information is provided in confidence by the notifying State Party."[74]

Although this provision may allow secrecy for reasons of national interest or defense, in reality it undermines the Convention's purpose in the most basic way by allowing a notifying party to restrict another party's use of its information to the detriment of the health and welfare of the receiving party's citizens. By allowing a state to restrict the use of information concerning a nuclear disaster within its borders, Article 5, Section 3 abrogates the Convention's effectiveness as a means of minimizing transboundary radiological consequences. In effect, the provision allows the state where the disaster occurs to dictate the actions taken by neighboring victim states. The presence of this section and the overwhelming support for the Convention together imply that while states would acknowledge the importance of the notification norm, they are still attached to their bases of power and are, thus, hesitant to relinquish complete control over information.

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[74] Article 2, "Notification and information," states the following:

In the event of an accident specified in article 1 (hereinafter referred to as "nuclear accident"), the State Party referred to in that article shall:

(a) forthwith notify, directly or through the International Atomic Energy Agency (hereinafter referred to as the "Agency"), those States which are or may be physically affected as specified in article 1 and the Agency of the nuclear accident, its nature, the time of its occurrence and its exact location where appropriate; and

(b) promptly provide the States referred to in sub-paragraph (a), directly or through the Agency, and the Agency with such available information relevant to minimizing the radiological consequences in those States, as specified in article 5."

Convention on Early Notification of a Nuclear Accident, *supra* note 65.

Furthermore, the Convention's scope is limited to accidents arising out of non-military facilities.[75] The five nuclear weapons states declared that they would voluntarily apply the Convention to all nuclear accidents, irrespective of origin,[76] and on October 6, 1986, shortly after the Notification Convention was opened for signature, the former Soviet Union provided information about an accident on board one of its nuclear-powered submarines which might have radiological consequences.[77] Nevertheless, both the United States and the former Soviet Union seemed unwilling to report accidents at military nuclear plants if disclosure would oblige them to reveal military secrets.[78] The fact that military nuclear accidents are not covered in the Convention again indicates that the norm regarding the provision of information is limited by the global community.

B. Compensation to Affected States

1. Claims Resulting from Chernobyl

Interestingly, none of the affected governments in Western Europe formally lodged an international legal claim for damages with the former Soviet Union.[79] This may reinforce the implication that there was no international legal basis for securing damages from the Soviet government. However, this failure cannot be attributed solely to lack of a legal obligation for compensation. Political expediency, for example, probably dissuaded affected governments from pursuing the issue of reparation through diplomatic channels. Some Western European governments appeared to be more concerned with securing Soviet

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[75] *See* Convention on Early Notification of a Nuclear Accident, *supra* note 65, at Art. I.

[76] *See Statements of Voluntary Application of Early Notification Conventaion to Accidents not Covered by the Convention*, 25 I.L.M. 1394 (1986) (verbatim excerpts from statements made at the IAEA Special Session adopting the Convention). The statements were made pursuant to Article 3 of the Convention, which states that "State Parties may notify in the event of nuclear accidents other than those specified" in the Convention, *id.*

[77] *See Moscow's New Policy Reflected in Sub Report*, *supra* note 36.

[78] *See* Paul Lewis, *Military Reactors are Issue at Nuclear Parely in Vienna*, N.Y. TIMES, June 11, 1986, at A4; Paul Lewis, *U.S. and Soviet Said to Try to Limit Fallout Pact*, N.Y. TIMES, Aug. 14, 1986, at A15.

[79] The Soviet Union was, however, faced with threats of litigation. *See supra* note 44.

cooperation in the long-term management of the risk of transboundary nuclear accidents in Europe than with obtaining compensation for economic loss ascribed to fallout from the stricken Soviet reactor.[80] These governments probably viewed insistence on Soviet liability and compensation as prejudicing prospects for future Soviet cooperation.

Similarly, it is quite possible that the "East-West factor" played a role in discouraging victim states from pressing international claims against the former Soviet Union.[81] Inspired by an analogy to the relations between developed and developing countries, the "East-West factor" connotes the perception that as between polluting Eastern European and polluting Western European countries, states' traditional international entitlements should be suspended. The underlying premise of this perception is that economically superior victim states should contribute to the costs of reducing transnationally harmful pollution and, in the case of accidents, should bear, or at least share, the costs of dealing with transboundary pollution.

2. Emerging Norms

The sensitivity of questions relating to the reparation of transboundary nuclear harm is demonstrated by a distinct trend in state practice to bypass the issue of liability and compensation whenever possible. Reference to state liability is completely absent from the EC Convention on Long-Range Transboundary Air-Pollution.[82] International practice regarding the issue of liability is relatively limited compared to international practice in the areas of prevention and mitigation of transboundary physical

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[80] *See e.g.*, Statement of Swedish Government, *infra* note 83; *see also Affirmation by Walter Wallman*, N.Y. TIMES, Nov. 7, 1986, at A35. The Eastern Bloc's political sensitivity to the idea of compensatory claims is discussed in *Chernobyl Creates New Tightrope: Despite Economic Damage, Bloc Seeks Not to Offend Soviet*, INT'L HERALD TRIB., June 9, 1986, at 1.

[81] There is evidence that such a "victim pays" philosophy influenced environmental relations between Eastern and Western Europe. *See generally* Handl, *supra* note 40.

[82] *See* Convention on Long-Range Transboundary Air Pollution, *supra* note 5, at 1445. Article 8 provides that Contracting Parties shall exchange available information on, *inter alia*, "(f) physico-chemical and biological data relating to the effects of long-range transboundary air pollution and the extent of damage." To that provision is appended a footnote which expressly provides: "The present Convention does not contain a rule on State liability as to damage." *Id.*

harm.[83] The resulting scarcity of bilaterally accepted, clear-cut standards upon which to build a multilateral legislative initiative accentuates the political sensitivity of addressing the liability issue multilaterally.[84] Thus, although states generally agree on the need to clarify the issue of reparation of transboundary nuclear harm, they also urge that it be approached with caution and deliberation.[85] The desire to sidestep the issue of states' international liability was present at the IAEA Board of Governors meeting in February, 1987, where several countries opposed preparation of a convention on the international liability of states on the grounds that it was "premature and unrealistic."[86] These states also argued that any legislative initiative aimed at launching such a convention would be too "complex and potentially fraught with controversy" to be undertaken within the Agency's framework.[87]

For this reason, the Chernobyl accident revealed general uncertainty within the international community as to the norms governing a state's liability for the transboundary consequences of nuclear accidents within its jurisdiction. A lack of clear principles derives in part from the general reluctance of nations to strengthen their international liability. This reluctance may be due to the nature of the risks attendant on the operation of

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[83] It is also true, however, that states give short shrift to the resolution of liability issues because they tend to regard arrangements for the prevention and mitigation of transboundary harm as taking priority over the settlement of liability issues. For example, see Statement of the Swedish Government:

> In terms of treaties there is no international agreement existing, whether bilateral or multilateral, on the basis of which a Swedish claim for damages against the USSR could be conceived.
>
> Insofar as customary international law is concerned, principles exist which might be invoked to support a claim against the USSR. The issues involved, however, are complex from the legal as well as the technical point of view and warrant careful consideration.
>
> In the present circumstances, the Government has felt that priority should be given, in the wake of the Chernobyl accident, to endeavors of another nature.

SAND, *supra* note 5, at 27.

[84] For a discussion of limitations of various multilateral environmental agreements, see Lynn Theresa Cahalan, Note, *Compensating Private Parties for Transnational Pollution Injury*, 58 ST. JOHN'S L. REV. 528, 540-51 (1984).

[85] *See Provisional Record of the IAEA Board of Governors Meeting*, IAEA Doc. GOV/OR.667, at 8, ¶16 (statement of the Indian governor); and 11, ¶25 (statement of the governor of the United States).

[86] *Id.* at 15, ¶39 (1987) (statement of the Japanese governor).

[87] *See, e.g., id.* at 11, ¶¶25, 73 (statements of the governor from the United States).

nuclear power plants. Nuclear power plants involve a very low risk of failure but, as demonstrated by Chernobyl, the costs of failure can be enormous. Even diligent state regulation of nuclear activities may be unable to prevent serious accidents from occurring. The widespread and long-lasting consequences of nuclear accidents, thus, may discourage the willingness of nuclear power countries to define binding norms of state liability.

In addition, due to the relatively recent growth and spread of nuclear activities and the fact that the major nuclear accidents that occurred prior to Chernobyl created no serious international repercussions, resolution of these issues has not been necessary. However, given the widespread and increasing reliance on nuclear power plants, it is foolish to assume that future accidents will not give rise to international damage claims. This fact, together with the significance and irreversibility of nuclear reactor damage, which may make nuclear power states reluctant to strengthen liability norms, should indicate the need for increased certainty in the compensation norms involved in transboundary nuclear harm.

The Soviet invocation of this international solidarity principle is unpersuasive in the context of accidental transboundary nuclear harm. First and most obvious, while nuclear activities are almost always controlled and supported by the operating state, there are few or no beneficial externalities to neighboring states. Second, the view that a major nuclear accident is the product of nuclear technology that victimizes both the source state and injured neighboring states while binding states together in a community, correctly recognizes that the world is environmentally interdependent. However, as a practical matter, cost sharing is likely to prove unacceptable as the international ground rule for allocating the transboundary costs of major nuclear accidents in a world divided into nuclear and non-nuclear power countries, hostile blocs and alliances. All of this accounts for the general international rejection of the "victim pays" principle.

CONCLUSION

The Chernobyl accident exposed how traditional notions of sovereignty and national boundaries have been transformed by the modern technological and industrial world. The Notification Convention, as the first multilateral agreement to provide a detailed framework for the application of norms relating to the provision of information in emergency situations, was an effort

by states to meet the challenge of heightened interdependence. However, the Convention's limited scope and its paragraph allowing states to restrict the use of confidential information indicate that the Convention is not an entirely adequate response to the notification problem raised by the Chernobyl accident.

Similarly, states' unwillingness to address the norms governing reparation for nuclear accidents is problematic. If the ostensibly temporary deferment of the compensation issue portends a continuation of the previous trend of altogether neglecting the norms of states' international liability, then present multilateral reform initiatives are seriously deficient. The reluctance of states to strengthen both their international liability and their obligation to provide immediate and unrestricted information in the case of all nuclear accidents negatively affects the authority of the relevant norms. A recognition of the relationship between environmental quality and human rights might impress upon states the urgency of the crisis before the world community. Only through a willingness to recognize the international dimension of nuclear hazards and an effort to make national rivalries and insecurities secondary to the global interest will states be able to strengthen the system of international cooperation